## REMARKS

Claims 1-24 are pending in the present application. Claim 2 has been canceled. Claims 1, 3, 6, 7, 8, 20, 22, 23, and 24 are currently amended. Thus, upon entry of the present amendment, claims 1, 3-24 will be subject to examination.

A. **Regarding the Objection to the Specification**

The Examiner has objected to the specification but the Office Action did not provide the reasons for the objection. During an informal telephone discussion on 02/06/2006, the Examiner indicated that the objection was related to the statement at paragraph [0001] of Publication No. US2004/0154669 A1 (the published application) stating to a foreign priority claim.

Accordingly, Applicant has deleted paragraph [0001] of Publication No. US2004/0154669 A1, because confirmation No. 1277 has indicated that the claim to foreign priority has already been made of record.

**B. Regarding the First Rejection of Claim 1 under 35 USC 102(a).**

For ready reference of the Examiner, a brief summary of certain features of Applicant's invention is provided herein. All paragraph references relate to Publication No. US2004/0154669 A1.

Second stage pressure regulators in the prior art tend to be plagued by air leaks, due to an imperfect contact between the edges of orifice 103 and of poppet seat 104 (Fig. 3, Prior Art). As explained in paragraph [0012], edges 103 are thin and sometimes sharp, and poppet seat 104 is manufactured from a relatively deformable material. Over time, edges 103 and poppet seat 104 come to adapt to each other, often causing poppet seat 104 to deform asymmetrically, for instance, because edges 103 are not exactly perpendicular to poppet seat 104, or because edges 103 exhibit some surface defects.

Consequently, when poppet seat 104 rotates around its longitudinal axis, for reasons that are detailed in the specification, the mutual adaptation of edges 103 and of poppet seat 104 is removed and an air leak develops. This may cause severe problems to the diver, because the air entering the second stage is at a pressure approximately 10 bar higher than atmospheric pressure.

In the present invention, more specifically, in the embodiment disclosed in the specification and in claim 1, a system of grooves and/or ribs on the inner wall of the tubular element prevents the rotation of the poppet stem by restraining the angular rotation of the tabs extending from the poppet while enabling the free axial translation of the poppet (Figs. 11-14).

Accordingly, the rejection of claim 1 under 35 USC 102(b), because of an alleged anticipation by US Patent No. 5,503,142 to Semeia ("the '142 patent"), is respectfully traversed.

The '142 patent discloses a regulator for an underwater breathing apparatus that has a push button for locking a shutter lever in a position that forces the shutter to just touch the shutter seat. This prevents damage to the shutter during inactive period of the regulator. The novelty of the '142 patent resides in the construction of that push button, as emphasized in claim 1 of the '142 patent (column 4, lines 30-35).

On the contrary, one of the novel features of Applicant's invention resides in the angular restraining system of the poppet tabs by means of a system of grooves and/or rails, as emphasized in the second-to-the-last limitation in Applicant's claim 1, beginning with "first means for ..." (page 4).

The Examiner has argued that the rotation of the poppet stem in the '142 patent would be prevented by pivot tips 22. Such reliance on the pivot 22 is misplaced. The '142 patent does not describe pivot tips, nor any role that such tips would have in preventing poppet rotation. Instead, the only reference to the pivot instead is at column 2, lines 55 and 57, within a different context. Further, the specification of the '142 patent indicates that the only role of pivot 22 is to connect lever 21 to shutter 20. Nowhere in the'142 is patent it is taught or suggested that pivot 22 is designed to prevent the rotation of the poppet. If such were the role of pivot 22, its reduced dimensions would subject pivot 22 to transversal and/or torque stresses of such magnitude to cause pivot 22 to collapse over time, with the consequent malfunctioning or blockage of lever 21 and possibly fatal consequences for the diver.

A side-by-side comparison of the '142 patent and of Applicant's disclosure shows that the elements of the '142 patent are not contained in Applicant's disclosure, and, conversely, that the elements of Applicant's disclosure are not contained in the '142 patent. Therefore, the withdrawal of the rejection of claim 1, as allegedly anticipated by the '142 patent, is respectfully

requested. In order to point out Applicant's invention with greater clarity, Applicant has amended the claims as discussed in section E below.

**C. Regarding the Second Rejection of Claim 1 under 35 USC 102(a).**

The rejection of claim 1 under 35 USC 102(b) as allegedly anticipated by US Patent No. 3,633,611 to MacNiel ("the '611 patent") is respectfully traversed.

The '611 patent teaches a second stage regulator that has a valve-actuating lever connected between the valve and a diaphragm, and a pair of exhaust ports and associated check valves. In the '611 patent, the rotation of valve member 98 is prevented by a square-ended shank portion 100, fitting into a square aperture 102 at the end of housing tube 80.

The teachings of the '611 patent and of Applicant's disclosure are patentably different. In particular, the '611 patent does not teach nor claim a rib and/or groove system that prevents the rotation of valve member 98 by angularly restraining the tabs elements extending from valve member 98. Conversely, Applicant does not teach nor claim the use of a square-ended shank fitting into a square aperture.

Further, the '611 patent does not teach the adjustment of the longitudinal pressure by means of a knob (indicated by Applicant's reference number 110). It should be noted that the turning of the knob to regulate spring pressure (a knob that is present in the majority of present day scuba systems) to the design disclosed in the '611 patent would cause a torque on valve member 98 of such magnitude to generate a rounding of square aperture 102 over time, with the consequent free rotation of valve member 98.

Still further, the '611 patent does not address nor solve the problem of air leaks at the air inlet due to a longitudinal arching of the poppet stem, especially when longitudinal pressure on the poppet is increased by the diver by means of the knob.

Still further, Applicant's invention provides for the easy assembly and reduced manufacturing costs of the inventive regulator (paragraphs [0017] and [0018]), which, Applicant submits, are not achieved with the design of the '611 patent.

A side-by-side comparison of the '611 patent and of Applicant's disclosure shows that the elements of the '611 patent are not contained in Applicant's disclosure, and, conversely, that the elements of Applicant's disclosure are not contained in the '611 patent. Therefore, the

withdrawal of the rejection of claim 1, as allegedly anticipated by the '611 patent, is respectfully requested. In order to point out Applicant's invention with greater clarity, Applicant has amended the claims as discussed in section E below.

**D. Regarding the Rejection of Claims 2, 3, 22, and 24.**

The rejection of claims 3, 22, and 24, as allegedly obvious over US Patent No. 3,633,611 to MacNiel ("the '611 patent") in view of US Patent 4,257,443 to Turney ("the '443 patent") is respectfully traversed. Because claim 2 has been canceled, this issue is now moot as to claim 2.

"Before answering Graham's 'content' inquiry, it must be known whether a patent or publication is in the prior art under 35 U.S.C. 102." *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (1987); MPEP 2141.01.I.

Applicant submits that the '611 patent is not in the prior art, as demonstrated above. Further, Applicant submits that even if the '611 patent were in the prior art, the combination of the '611 and '443 patents does not teach nor suggest Applicant's invention.

The '443 patent discloses a valve having a poppet that includes a seal ring causing the valve to be in a closed position when a spring exerts pressure on ribs extending from the poppet, and causing the valve to be in an open position when the poppet translates forward and into an orifice connected to the oxygen source (Fig. 6). Those ribs are positioned at the end of the poppet that is opposite to the orifice, and such ribs translate axially within slots in the tubular structure that contains the poppet. The forward translation of the poppet comes to end when such ribs hit a wall within the tubular structure (Figs. 1 and 6).

On the contrary, in Applicant's invention there is no need to have a wall within the tubular structure to stop the axial translation of the ribs, and consequently of the poppet. On the contrary, the '443 patent regards this wall structure as a necessary element of the invention (see, e.g. col. 2, ll. 7-9 and 45-50; col. 3, ll. 36-40 and 46-49).

Further, the '443 patent teaches guiding slots 33 that are wide enough to allow a slight amount of lateral movements of rib extensions 61 (col. 2, ll. 65-67), while Applicant's invention is aimed at restraining, that is, completely avoiding, the lateral movement of the ribs (see, for instant, paragraph [0037] describing "a perfectly straight motion."). Therefore, the '443 patent teaches away from Applicant's invention.

Still further, it must be observed that the pressure exercised by the spring on the ribs in the '443 patent causes the poppet to be subject to tensional stress, and not to compressive stress as in Applicant's invention. This is relevant, as the poppet in the '443 patent will not exhibit the tendency to arch longitudinally due to compressive forces as in Applicant's invention. Therefore, the ribs in the '443 patent are positioned at the end of the poppet and have a small axial thickness, as these ribs do not provide longitudinal stiffness to the poppet as is the case in Applicant's invention.

Still further, Applicant's invention includes a knob (identified by numeral 110) that modifies the tension of the poppet spring. If a knob were added to the '443 disclosure, the position of the ribs at the end of the poppet, and their modest thickness in the poppet's axial direction, would cause such ribs to wear out rapidly, making their presence essentially useless.

As shown, the constructions and operations of the disclosures in the '611 and '443 patents are patentably different from Applicant's, and nothing in the '611 and '443 patent teaches or suggests Applicant's invention.

In view of the foregoing, the withdrawal of the rejections of claims 2, 3, 22, and 24 is respectfully requested. In order to point out Applicant's invention with greater clarity, Applicant has amended the claims as discussed in section E below.

**E. Claim Amendments.**

Claim 1 has been amended to point out with greater clarity that one or more of the centering tabs guided in a system of grooves and/or ribs on the inner wall of the tubular element. Further, claim 1 has been amended to point out with greater clarity that the radial movement of the centering tabs is to be prevented, while the systems of grooves and/or ribs provide no axial restrain to the movement of the poppet, contrary to the teachings of each of the '142, '611, and '443 patents.

Claim 2 has been canceled, as the limitations of claim 2 have been included in amended claim 1.

Claim 3 has been amended to indicate the present dependency from amended claim 1, and to introduce minor improvements in the flow of language.

Claim 6-8 have been amended to indicate the present dependency from amended claim 1.

Claims 22-24 have been amended to indicate the present dependency from amended claim 1.

Applicant submits that the argument provided above, the amendments introduced in claim 1, and the dependency of claims 3, 22, and 24 from now allowable claim 1, has put claims 1, 3, 22, and 24 in condition for allowance.

## CONCLUSION

In view of the amendments and remarks submitted herein, Applicant submits that the present application is in condition for allowance and respectfully requests a notice to that effect.

Should the Examiner require any additional information, the Examiner is invited to contact the undersigned attorney by telephone, fax or e-mail,

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Respectfully submitted,

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